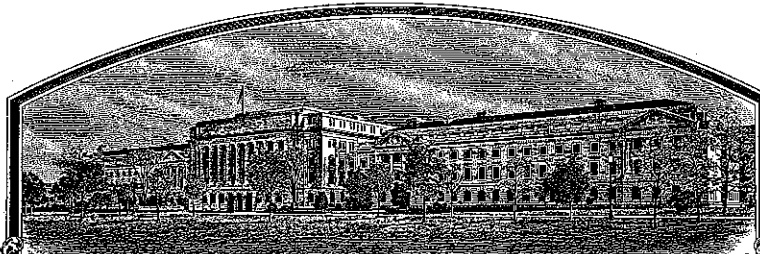


No.

200500169



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

NSH Research Foundation

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF SEEDS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

SOYBEAN

'Pembina'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this fifteenth day of June, in the year two thousand and five.

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture



REPRODUCE LOCALLY. Include form number and date on all reproductions

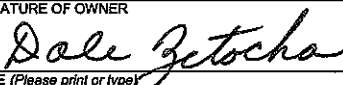
Form Approved - OMB No. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER NDSU Research Foundation		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME ND99-2282		3. VARIETY NAME 'Pembina'	
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) C/O Executive Director 1735 NDSU Research Park Drive PO Box 5002 Fargo, ND 58105-5002		5. TELEPHONE (include area code) 701-231-8931		<div style="border: 1px solid black; padding: 5px;"> FOR OFFICIAL USE ONLY PVP NUMBER 200500169 FILING DATE 3/3/2005 </div>	
		6. FAX (include area code) 701-231-6661			
7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) NDSU Research Foundation 501(c)(3) Corp.		8. IF INCORPORATED, GIVE STATE OF INCORPORATION ND		9. DATE OF INCORPORATION May 1, 1989	
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers)				<div style="border: 1px solid black; padding: 5px;"> FILING AND EXAMINATION FEES: \$3,652.00 DATE 3/3/2005 CERTIFICATION FEE: \$432.00 DATE 5-4-2005 </div>	
<table border="0"> <tr> <td>Theodore C. Helms Department of Plant Sciences North Dakota State University Fargo, ND 58105-5051</td> <td>Dale Zetocha NDSU Research Foundation 1735 NDSU Research Park Drive PO Box 5002 Fargo, ND 58105-5002</td> </tr> </table>					
Theodore C. Helms Department of Plant Sciences North Dakota State University Fargo, ND 58105-5051	Dale Zetocha NDSU Research Foundation 1735 NDSU Research Park Drive PO Box 5002 Fargo, ND 58105-5002				
11. TELEPHONE (include area code) 701-231-8136		12. FAX (include area code) 701-231-8474		13. E-MAIL ted.helms@ndsu.edu dale.zetocha@ndsu.edu	
14. CROP KIND (Common Name) Soybean		16. FAMILY NAME (Botanical) Leguminosae		18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (OPTIONAL) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF SO, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERCIALIZATION.	
15. GENUS AND SPECIES NAME OF CROP Glycine max		17. IS THE VARIETY A FIRST GENERATION HYBRID? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			
19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)				20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act) <input checked="" type="checkbox"/> YES (If "yes", answer items 21 and 22 below) <input type="checkbox"/> NO (If "no", go to item 23)	
a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$3,652), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)				21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, WHICH CLASSES? <input checked="" type="checkbox"/> FOUNDATION <input checked="" type="checkbox"/> REGISTERED <input checked="" type="checkbox"/> CERTIFIED	
				22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS. <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED (If additional explanation is necessary, please use the space indicated on the reverse.)	
23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)				24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)	
25. The owners declare that a viable sample of basic seed of the variety has been furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate. The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.					
SIGNATURE OF OWNER 			SIGNATURE OF OWNER		
NAME (Please print or type) Dale Zetocha			NAME (Please print or type)		
CAPACITY OR TITLE Executive Director		DATE 3/2/05		CAPACITY OR TITLE	
				DATE	

(See reverse for instructions and information collection burden statement)

GENERAL: To be effectively filed with the Plant Variety Protection Office (PVPO), **ALL** of the following items must be **received** in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to reproduce the variety, or for tuber reproduced varieties verification that a viable (*in the sense that it will reproduce an entire plant*) tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for \$3,652 (\$432 filing fee and \$3,220 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice.) Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfilled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 401, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of \$432 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office

Telephone: (301) 504-5518

FAX: (301) 504-5291

Homepage: <http://www.ams.usda.gov/science/pvpo/pvpindex.htm>

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority and provide evidence that name has been cleared by the appropriate recognized authority before the Certificate of Protection is issued. For example, for agricultural and vegetable crops, contact: Seed Branch, AMS, USDA, 10301 Baltimore Avenue, Suite 401 NAL Building, Beltsville, MD 20705. Telephone: (301) 504-5682 <http://www.ams.usda.gov/lsg/seed.htm>.

ITEM

- 19a. Give:
- (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
 - (2) the details of subsequent stages of selection and multiplication;
 - (3) evidence of uniformity and stability; and
 - (4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 19b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
- (1) identify these varieties and state all differences objectively;
 - (2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
 - (3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.
- 19c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 19d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 19e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
20. If "Yes" is specified (*seed of this variety be sold by variety name only, as a class of certified seed*), the applicant **MAY NOT** reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
23. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
24. See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.

22. CONTINUED FROM FRONT (Please provide a statement as to the limitation and sequence of generations that may be certified.)

23. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)

24. CONTINUED FROM FRONT (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

Pioneer variety 9004 issued U.S. PVP Certificate No. 9600050.

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. The fees for filing a change of address; owner's representative; ownership or assignment; or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 1.4 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, sexual orientation, marital or family status, political beliefs, parental status, or protected genetic information. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call 202-720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

Exhibit A

Origin and Breeding History of the Variety Pembina

Pembina, tested as ND no., 99-2282, was derived from the cross of ND93-5849 X 'Pioneer 9004', made in 1996. ND93-5849 is an experimental line developed by North Dakota State University, Fargo, ND that was never released as a named cultivar. The pedigree of ND93-5849 is 'KG20' X 'Maple Donovan'. KG20 is a cultivar that was available commercially and developed by King Agro, a division of Kinggroup, Inc., Chatham, Ontario. Pioneer 9004 is a cultivar that was available commercially and developed by Pioneer Hi-Bred Int., Inc. The F_1 plant was grown in the 1996-1997 Chile winter nursery. The F_2 seed was grown in the summer of 1997 and advanced to the F_3 generation by the single-pod bulk method. The F_3 population was grown in the 1997-1998 Chile winter nursery and advanced to the F_4 generation by the single-pod bulk method. The F_4 population was grown at Casselton, ND in the summer of 1998. F_4 plants from the segregating population were individually threshed in the fall of 1998 and $F_{4:5}$ plant-rows were selected in 1999. ND99-2282 was first tested in replicated yield trials in 2000. Pembina was selected for early maturity, high yield, and lodging resistance. Pembina was evaluated in the Uniform Regional Soybean Tests: Northern States as a Maturity Group 00 experimental line in 2004. Individual $F_{4:7}$ plants were threshed in 2001 and 88 single-plant selections were evaluated for uniformity in the summer of 2002 in Fargo and Prosper, ND. Of these 88 purification rows, 76 rows were individually harvested and bulked after evaluation of hilum color, plant maturity, flower color, plant height, pubescence color, seed coat luster, and pod color. Breeder seed of ND99-2282 was increased in the summer of 2003. In the summer of 2004 the Foundation seed of ND99-2282 was increased at Casselton and Carrington, ND. Pembina was released Jan. 18, 2005 as an F_{10} generation pure line soybean cultivar. Variants that include up to 0.2% buff hila, 0.2% grey hila, 0.2% brown hila, 0.2% tawny pubescence, 0.2% white flower color and 0.3% tan pods are considered within normal variation for the cultivar Pembina. Pembina has been observed to be uniform and stable for a period of three years for the characteristics described within the application.

Selection criteria in developing Pembina included early maturity, high yield, lodging resistance, phytophthora root rot resistance, and tolerance to iron deficiency chlorosis as noted on following page (bt: 3/8/2005 per applicant's authorization).

Exhibit B

Novelty Statement

1. Pembina was developed primarily for early maturity, high yield, lodging resistance, phytophthora root rot resistance, and tolerance to iron deficiency chlorosis.
2. Jim is the most similar variety to Pembina. Pembina has purple flowers, gray pubescence, brown pods, and yellow hila. Jim has purple flowers, gray pubescence, brown pods and yellow hila. Pembina is resistant to Races 3 and 4 of phytophthora root rot, while Jim is susceptible to Races 3 and 4.

*the tests for race 4 of phytophthora were conducted using 2 different isolates under greenhouse conditions. This is the equivalent of 2 separate tests (= 2 locations or 2 years, or specification of the gene). JPS
March 18, 2005*

REPRODUCE LOCALLY. Include form number and date on all reproductions.

Form Approved - OMB No. 0581-0055

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this collection of information is (0581-0055). The time required to complete this information collection is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact the USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

**U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705**

**EXHIBIT C
(Soybean)**

**OBJECTIVE DESCRIPTION OF VARIETY
SOYBEAN (*Glycine max* (L.) Merr.)**

NAME OF APPLICANT(S)	FOR OFFICIAL USE ONLY
NDSU Research Foundation	PVPO NUMBER
ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)	200500169
PO Box 5014	VARIETY NAME
Fargo, ND 58105-5014	Pembina
	TEMPORARY OR EXPERIMENTAL DESIGNATION
	ND99-2282

PLEASE READ ALL INSTRUCTIONS CAREFULLY: Place the appropriate number that describes the varietal character of this variety in the boxes below.

Place a zero in the first box (e.g.

9	9	9
---	---	---

 or

0	9
---	---

) when number is either 99 or less or 9 or less respectively. Data for quantitative

plant characters should be based on a minimum of 100 plants. Comparative data should be determined from varieties entered in the same trial. Royal Horticultural Society or any recognized color standard may be used to determine plant colors; designate system used:

Please answer all questions for your variety; lack of response may delay progress of your application.

A. MORPHOLOGY

Seed Shape:

3	1 = Spherical (L/W, L/T, and T/W ratios < 1.2)	2 = Spherical-Flattened (L/W ratio > 1.2; L/T ratio < 1.2)
	3 = Elongate (L/T ratio > 1.2; T/W ratio < 1.2)	4 = Elongate-Flattened (L/T ratio > 1.2; T/W ratio > 1.2)

Seed Coat Color:

1	1 = Yellow	2 = Green	3 = Brown	4 = Black	5 = Other (Please Specify) _____
---	------------	-----------	-----------	-----------	-------------------------------------

Seed Coat Luster:

2	1 = Dull	2 = Shiny
---	----------	-----------

Seed Size:

1	5	grams/100 seeds
---	---	-----------------

Hilum Color:

2	1 = Buff	2 = Yellow	3 = Brown	4 = Gray	5 = Imperfect Black
	6 = Black	7 = Other (Please Specify) _____			

2005 00 169

A. MORPHOLOGY (Continued)

Cotyledon Color:

☐ 1 = Yellow 2 = Green

Seed Protein Peroxidase Activity:

☐ 2 1 = Low 2 = High

Hypocotyl Color:

<input type="checkbox"/> 3	1 = Green ('Evans' or 'Davis')	2 = Green with Bronze Bands below Cotyledons ('Woodworth' or 'Tracy')	3 = Light Purple below Cotyledons ('Beeson' or 'Pickett 71')	4 = Dark Purple extending to unifoliate leaves ('Hodgson', 'Coker', or 'Hampton 266A')
----------------------------	-------------------------------------	---	--	--

Leaflet Shape:

☐ 2 1 = Lanceolate 2 = Oval 3 = Ovate 4 = Other (Please Specify) _____

Flower Color:

☐ 2 1 = White 2 = Purple 3 = White with a Purple Throat

Pod Color:

☐ 2 1 = Tan 2 = Brown 3 = Black

Pubescence Color:

☐ 1 1 = Gray 2 = Brown (Tawny) 3 = Light Tawny

Plant Habit:

☐ 3 1 = Determinate 2 = Semi - Determinate 3 = Indeterminate 4 = Intermediate

Maturity Group:

<input type="checkbox"/> 0	<input type="checkbox"/> 2	1 = 000	2 = 00	3 = 0	4 = I	5 = II
		6 = III	7 = IV	8 = V	9 = VI	10 = VII
		11 = VIII	12 = IX	13 = X	14 = XI	15 = XII

Maturity Subgroup:

☐ 5 Please enter a value from 0 - 9

B. DISEASE REACTIONS

0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Tolerant

Bacterial

☐ 0 Bacterial Pustule (*Xanthomonas campestris* pv. *glycines* (Nakano) Dye)

☐ 0 Bacterial Blight (*Pseudomonas syringae* pv. *glycinea* (Coerper) Young, Dye, & Wilkie)

☐ 0 Wildfire Blight (*Pseudomonas syringae* pv. *tabaci* (Wolf & Foster) Young, Dye, & Wilkie)

B. DISEASE REACTIONS (Continued)

0 = Not Tested

1 = Susceptible

2 = Resistant 3 = Tolerant

Fungal

 Brown Spot (*Septoria glycines* Hemmi)
Frogeye Leaf Spot (*Cercospora sojina* Hara)

race 1

race 2

race 3

race 4

Other (Please Specify) _____

Target Spot (*Corynespora cassicola* (Berk. & Curt.) Wei)
Downey Mildew (*Peronospora trifoliorum* var. *manchurica* (Naum.) Syd. ex Gäum)
Powdery Mildew (*Microsphaera diffusa* Cke. & Pk.)
Brown Stem Rot (*Phialophora gregata* (Allington & Chamberlain) W. Gams.)
Stem Canker (*Diaporthe phaseolorum* (Cke. & Ell.) Sacc. var. *caulivora* Athow & Caldwell)
Pod and Stem Blight (*Diaporthe phaseolorum* (Cke. & Ell.) Sacc. var. *sojae* (Lehman) Wehm.)
Purple Seed Stain (*Cercospora kikuchii* (T. Matsu. & Tomoyasu) Gardener)
Rhizoctonia Root Rot (*Rhizoctonia solani* Kühn)Phytophthora Root Rot (*Phytophthora megasperma* Drechs. f. sp. *glycinea* (Kuan & Erwin))

race 1

race 8

race 15

race 22

race 2

race 9

race 16

race 23

race 3

race 10

race 17

race 24

race 4

race 11

race 18

race 25

race 5

race 12

race 19

race 26

race 6

race 13

race 20

Other (Please Specify)

race 7

race 14

race 21

Bud Blight (Tobacco Ringspot Virus)

Yellow Mosaic (Bean Yellow Mosaic Virus)

B. DISEASE REACTIONS (Continued)

0 = Not Tested

1 = Susceptible

200500169

2 = Resistant

3 = Tolerant

☐ 0

Cowpea Mosaic (Cowpea Chlorotic Virus)

☐ 0

Pod Mottle (Bean Pod Mottle Virus)

☐ 0

Seed Mottle (Soybean Mosaic Virus)

Nematode

Soybean Cyst Nematode (*Heterodera glycines* Ichinohe)☐ 0

race 1

☐ 0

race 4

☐ 0

race 9

☐ 0

race 2

☐ 0

race 5

☐ 0

race 14

☐ 0

race 3

☐ 0

race 6

☐ 0

Other (Please Specify) _____

☐ 0Lance Nematode (*Hoplolaimus columbus* Sher)☐ 0Southern Root Knot Nematode (*Meloidogyne incognita* (Kofoed & White) Chitwood)☐ 0Northern Root Knot Nematode (*Meloidogyne hapla* Chitwood)☐ 0Peanut Root Knot Nematode (*Meloidogyne arenaria* (Neal) Chitwood)☐ 0Reniform Nematode (*Rotylenchus reniformus* Linwood & Olivera)☐ 0Javanese Nematode (*Meloidogyne javanica* (Treub) Chitwood)☐ 0

Other Nematode (Please Specify) _____

C. PHYSIOLOGICAL RESPONSES

0 = Not Tested

1 = Susceptible

2 = Resistant

3 = Tolerant

☐ 3

Iron Chlorosis on Calcareous Soil.

☐ 0

Phosphorus

☐ 0

Other (Please Specify) _____

☐ 0

Boron

☐ 0

Aluminum

☐ 0

Salt

☐ 0

Drought

2005 00 169

D. INSECT REACTIONS

0 = Not Tested

1 = Susceptible

2 = Resistant

3 = Tolerant

☐ 0 Mexican Bean Beetle (*Epilachna varivestis* Mulsant)☐ 0 Potato Leaf Hopper (*Empoasca fabae* (Harris))☐ 0 Other (Please Specify) _____**E. HERBICIDE REACTIONS**

0 = Not Tested

1 = Susceptible

2 = Resistant

☐ 0 Metribuzin☐ 0 Bentazone☐ 0 Sulfonylurea☐ 1 Glyphosate☐ 0 Glufosinate☐ 0 Pendimethalin☐ 0 Other (Please Specify) _____**F. TRANSGENIC COMPOSITION**

Has the development of the subject variety included the insertion of genetic material from an organism other than a soybean, or, the removal of genetic material from the application variety?

If yes, please complete the following information requests*. Use additional pages if necessary.

☐

YES

☒

X

NO

1. Please state the vector's name:

2. Please state the vector components:

3. Please describe the genetic material successfully transferred into the subject variety:

4. Please describe the insertion protocol:

* A literature citation(s) explaining the four information requests above may be an acceptable alternative to completion of the "Transgenic Composition" portion of this form.

G. BIOCHEMICAL MARKERS

Please describe any biochemical information here, which you believe will be helpful in further describing the subject variety (e.g. Simple Sequence Repeats, Restriction Fragment Length Polymorphisms, Isozymic Characterization). Use additional pages if necessary.

Thornton, Beretha

From: Ted.Helms@ndsu.nodak.edu%inter2 [Ted.Helms@ndsu.nodak.edu] on behalf of Ted.Helms@ndsu.nodak.edu
Sent: Friday, March 04, 2005 3:37 PM
To: Thornton, Beretha
Subject: Pembina soybean data

Dear Beretha,
 in our phone conversation dated March 3, 2005 you requested the data that provide evidence that 'Pembina' is different from 'Jim' for Race 4 Phytophthora root rot resistance. Our previous evaluation of 'Jim' has shown that it is susceptible to PRR races 3 and 4. We then tested 'Pembina' for Race 4 in duplicate tests. We used two different isolates of Race 4, one for each of the two tests. The checks were 'Glacier' which is known to be resistant to Race 4 and 'McCall' which is known to be susceptible to Race 4. The results were consistent for both tests: 'McCall' was susceptible, 'Glacier' and 'Pembina' were resistant to PRR Race 4 per cotyledon inoculation.

Test 1			
Entry	# seeds inoculated	# surviving plants	# dead plants
Glacier	12	12	0
McCall	12	1	11
Pembina	8	7	1

Test 2			
Entry	# seeds inoculated	# surviving plants	# dead plants
Glacier	12	12	0
McCall	11	2	9
Pembina	11	11	0

I hope this data is sufficient for demonstrating that 'Pembina' is resistant to PRR Race 4.

Sincerely,
 Ted Helms

The tests for race 4 of phytophthora were conducted using 2 different isolates under greenhouse conditions. This is the equivalent of 2 separate tests (= 2 locations or 2 years, or specification of the gene). JH

March 18, 2005

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). The information is held confidential until the certificate is issued (7 U.S.C. 2426).

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

1. NAME OF APPLICANT(S) NDSU Research Foundation	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER ND99-2282	3. VARIETY NAME 'Pembina'
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) C/O Executive Director 1735 NDSU Research Park Drive PO Box 5002 Fargo, ND 58105-5002	5. TELEPHONE (Include area code) (701) 231-8931	6. FAX (Include area code) (701) 231-6661
7. PVPO NUMBER		2005 00 16 9

8. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. If no, please explain. ☒ YES ☐ NO9. Is the applicant (individual or company) a U.S. national or a U.S. based company? If no, give name of country. ☒ YES ☐ NO10. Is the applicant the original owner? ☐ YES ☒ NO If no, please answer one of the following:

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?

☒ YES ☐ NO If no, give name of country

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?

☐ YES ☐ NO If no, give name of country

11. Additional explanation on ownership (Trace ownership from original breeder to current owner. Use the reverse for extra space if needed):

See additional Exhibit E Statement on the Basis of the Applicant's ownership included in this application.

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 0.1 hour per response, including the time for reviewing the instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, sexual orientation, marital or family status, political beliefs, parental status, or protected genetic information. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

Exhibit E

Dr. Theodore Helms, an employee of the North Dakota Agricultural Experiment Station and North Dakota State University, is the plant breeder who developed 'Pembina', the soybean cultivar for which Plant Variety Protection is hereby sought. The employee by agreement and because of the conditions of the use of the facilities and funds of the North Dakota Agricultural Experiment Station and North Dakota State University has assigned all ownership rights to Pembina soybean to the North Dakota Agricultural Experiment Station and North Dakota State University.

North Dakota State University on behalf of the North Dakota Agricultural Experiment Station has assigned ownership to the NDSU Research Foundation. The NDSU Research Foundation is a nonprofit corporation set up to own and manage the intellectual property of North Dakota State University.